

Stress Levels and Adaptability in Parents of Toddlers With and Without Autism Spectrum Disorders

Mary J. Baker-Ericzén, Lauren Brookman-Frazee, and Aubyn Stahmer
Child and Adolescent Services Research Center at Children's Hospital, San Diego
and the University of California, San Diego

The toddler years can be a particularly stressful time for all parents, however, parents of children with disabilities may experience additional sources of stress. Recent literature on early education for children with disabilities promotes inclusion with typical peers with increases in the availability of inclusive programs. However, little is known about early intervention inclusion programs and parental factors such as stress and adaptability. The current study expands the research for children with disabilities by investigating the associations of having a young child with an Autism Spectrum Disorder (ASD) on multiple dimensions of parental stress for mothers and fathers and how participation in an inclusive toddler program may be related to these stress levels. Results for this community sample are consistent with previous research indicating that both mothers and fathers of children with ASD report significantly elevated levels of both child and parent related stress in comparison with parents of typically developing toddlers. Following their child's participation in the inclusion program, mothers of children with ASD report significant reductions in child-related stress but no reductions in the parent-related stress domain. No changes were seen with either child or parent domain for fathers. Lastly, a child's level of social skills was a significant predictor of child-related maternal stress for children with autism. This pattern was not seen in fathers of these children. Implications for early intervention program modifications, such as increasing family support and incorporating adjunctive parent interventions for parents with elevated levels of stress are discussed.

DESCRIPTORS: toddlers, inclusion, community program, parental stress, autism

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Address all correspondence and reprint requests to Mary J. Baker-Ericzén, Ph.D., Child & Adolescent Services Research Center, 3020 Children's Way MC5033, San Diego, Ca. 92123-4282.

Although parenting a typically developing child can be stressful (Crnic & Greenberg, 1990), research indicates that parents of children with disabilities are at increased risk of experiencing elevated levels of stress. It has been estimated that as many as two thirds of mothers of young children with developmental delays experience significantly elevated stress levels (Tomanik, Harris, & Hawkins, 2004). Several studies have shown that parents of young children with developmental delays experience higher levels of child-related stress than parents of children without delays (Baker, Blacher, Crnic, & Edelbrock, 2002; Cameron, Dobson, & Day, 1991). In particular, mothers of children with autism report both higher stress levels and lower parenting competency than mothers of children without disabilities (Fisman & Wolf, 1991; Rodrigue, Morgan, & Geffken, 1990). There is less information available about the stress levels of both mothers and fathers with children with autism. Two studies suggest that both parents experience similar levels of stress (Hastings, 2003; Noh, Dumas, Wolf, & Fisman, 1989) and one study revealed that mothers showed more stress than fathers, specifically related to child rearing (Moes, Koegel, Schreibman, & Loos, 1992). These mixed results reveal a need for examining both mothers and fathers when studying parental stress.

Sources of Stress for Parents of Children with Autism

Parents of children with autism may experience specific sources of stress associated with child's disability and familial issues. For example, research has shown that parents of children with autism exhibit a characteristic stress profile which includes stress related to the child's uneven intellectual profiles, pervasive disruptive behaviors and long-term care (Bebko, Konstantareas, & Springer, 1987; R.L. Koegel, Schreibman, Loos, Dirlich-Wilhelm, Dunlap, Robbins, & Plienis, 1992; Moes, 1995; Moes et al., 1992).

Child Characteristics

Specific sources of parental stress may include certain child characteristics such as verbal expressive difficulties and cognitive inconsistencies (Bebko et al., 1987; Moes, 1995). Research on young children with developmental

delays indicates that behavior problems (Baker et al., 2002; Floyd & Gallagher, 1997; Hodapp, Dykens, & Masino, 1997) and severity of impairment (Tobing & Glenwichk, 2002) are important predictors of parental stress. Other child characteristics such as adaptability, demandingness, and distraction may increase stress (Cameron et al., 1991). Both mothers and fathers of children with developmental delays and autism report elevated stress regarding their ability to relate to their children (Dyson, 1997; Koegel, Schriebman, Loos, & Dirlich-Wilhelm, 1992).

Care-taking Demands

In addition to child characteristics that may place stress on parents of children with developmental disabilities, a number of care-taking responsibilities increase the sources of stress for these parents, particularly mothers who are most often the primary caregiver. Significant sources of stress may include parental concerns about interacting with professionals and difficulty obtaining services (Todis & Singer, 1991). Families are required to gather and make sense of significant amounts of information about the diagnosis and recommended intervention methods. For children with autism, there are a number of behavioral interventions and "alternative" treatment methods that are advertised for improving the functioning of children with autism that can increase stress and anxiety for parents (Guralnick, 2000). Likewise, the time and energy needed to identify interventions, provide care for the child and for siblings, and monetary stress from loss of time at work and/or the cost of additional therapies places stress on existing family resources (e.g., Birenbaum, Guyot, & Cohen, 1990; Kelly & Booth, 1999). In addition, parents often experience stress related to the prospect of providing long-term care for their child and the associated limits on family opportunities (Bouma & Schweitzer, 1990; Gallagher & Bristol, 1989; Koegel et al., 1992).

Parenting Stress and Interventions

There is evidence that parental stress can both influence the effectiveness of interventions and can be influenced by interventions. Most of the research in this area has been focused on parent education interventions in particular. For example, parent education programs that teach parents naturalistic strategies to increase their child's communication have been shown to result in decreased levels of parent stress (Koegel, Bimbela & Schriebman, 1996) and depression (Bristol, Gallagher, & Holt, 1993). Likewise, Feldman and Werner (2002), documented reductions in parent stress and increases in self-efficacy in parents who participated in behavioral parent training. This relationship is not unidirectional, however. For example, lower parent-related stress is associated with improved child progress (Plienis, Robbins, & Dunlap, 1988; Robbins, Dunlap, & Plienis, 1991).

These studies indicate that stress is an important variable in both designing and evaluating outcomes of intervention.

Early Intervention and Inclusion

In recent years, there has been a movement in early intervention to provide the most naturalistic educational experiences possible. In fact, regulations state "To the maximum extent appropriate to the needs of the child, early intervention services must be provided in natural environments, including the home and community settings in which children without disabilities participate" (Part C of the Individuals with Disabilities Education Act, 34 CFR Part 303, Early Intervention Program for Infants and Toddlers with Disabilities, section 300.12b). This often includes educating children with disabilities alongside same-aged typically developing children. This integration of children with disabilities into the classroom setting often includes the integration of specialized services as well. These can include speech therapy, occupational therapy and applied behavior analysis techniques. Parents may also receive additional services such as parent education and parent training to increase their skills in increasing their child's development.

Positive Impact on Children With Disabilities

Much of the literature promotes inclusion programs for children with disabilities. Most research on inclusive preschool programs reports that children with developmental disabilities in integrated classes make gains in language, cognitive, and motor development that are above or comparable to peers in special education classrooms (e.g., Fewell & Oelwein, 1990; McGee, Morrier, & Daly, 1999; Odom, 2000; Peck, Odom, & Bricker, 1993). Additionally, a study by Burack and colleagues (1992) demonstrated that students with special needs in integrated (as compared to segregated) programs are better able to learn, accept individual differences, interact, communicate, and develop friendships. Toddler-age children have been included in these studies, indicating that very young children with disabilities benefit from education that includes typically developing peers (Ingersoll, Schriebman, & Stahmer, 2001; McGee et al., 1999). In fact, a previous study by our research team examined the outcomes of children enrolled in our inclusion program. Benefits of this toddler inclusion program included improved language and communication, improved social skills, improved play skills and marked gains on cognitive assessments (Stahmer & Ingersoll, 2004). Research clearly indicates that inclusive classroom programs offer many advantages for children with disabilities and those demonstrating special needs.

Positive Impact on Typically Developing Children

A small number of studies have focused on the benefits of inclusive school programming for typically

developing preschool and school-age children. One study reported that typically developing children from inclusive classrooms gave significantly higher acceptance ratings to hypothetical peers with disabilities than did children from settings that did not include children with disabilities (Hestenes & Carroll, 2000). Daly (1991) also reported that typically developing children exhibited advanced social skills such as how to get along with others. Lastly, Strain and Cordisco (1994) reported that typically developing children in inclusive settings displayed both improved social skills as well as fewer disruptive behaviors.

Impact on Families

A recent study by Stahmer, Carter, Baker and Miwa (2003) found that parents of typically developing toddlers reported greater satisfaction with an inclusion program than parents of typically developing toddlers enrolled in a standard preschool program due to improved teacher to child ratios, high teacher training, and the availability of specialty services. However, stress levels in these parents were not measured. Additionally, the stress levels of the parents of the toddlers with autism in such programs have not been assessed. It is possible that seeing the progress of typically developing children educated alongside a child with autism may increase parent stress.

Current Study

The current study uses a quasi-experimental pre-post design to examine parental stress before and after involvement in an inclusive toddler program. Parents of children who are developing typically and parents of children who have an Autism Spectrum Disorder (ASD) schooled together in an inclusive child-care program, completed questionnaires on parent stress before and after program involvement. The purpose of this study is to: 1) measure parental stress levels in parents who have children enrolled in a toddler inclusion program and compare stress levels of parents of typically developing toddlers to those of parents of children with ASD for both mothers and fathers, 2) assess the changes associated with child participation in an inclusion toddler program on stress levels for both groups of mothers and fathers and 3) identify child characteristics that may predict stress levels in mothers and fathers of children with ASD.

Method

Participants

Eligible participants were parents of toddlers enrolled in the Children's Toddler School (CTS) who had completed both pre and post test measures and had been enrolled in the program for a minimum of six months. They included parents of 37 children with Autism Spectrum Disorders (ASD) and 23 typically developing children (TDC). Parents completed a battery of assessments

about their individual stress levels and their child's development. A total of 23 mothers and 16 fathers of typically developing children and 37 mothers and 27 fathers of children with ASD participated in the study. All of the parents were English speaking and proficient in reading and writing in English.

The mean age of children with ASD was 28.35 months ($SD = 5.2$) at entry. Study participants were enrolled in the inclusion program for a minimum of 6 months. The mean length of time these children were enrolled in the program was 8.00 months ($SD = 3.53$). All of the children with ASD enrolled in the program were funded by *Regional Center California Early Start*, a public service program for children with or at risk for ASD. Children with ASD were eligible for participation in the toddler program if an independent clinician provided a diagnosis of ASD based on the criteria for Autistic Disorder or Pervasive Developmental Disorder, Not Otherwise Specified in the Diagnostic and Statistical Manual of Mental Disorders, 4th Ed. (APA, 1994). Diagnoses were confirmed by the third author through observation and use of standardized assessments including the Gilliam Autism Rating Scale (GARS) (Gilliam, 1995). The mean age of typically developing children at entry was 24.35 months ($SD = 5.03$). They were referred by childcare referral sources and through word-of-mouth in the community. The mean length of time these children were enrolled in the program was 11.04 months ($SD = 5.49$). They were enrolled on a fee-for-service basis. All typically developing children were screened upon entry into the program. If a child exhibited significant cognitive delays, communicative or motor delays, appropriate early intervention referrals were made. Since data collection began, two children exhibiting cognitive delays were not enrolled in the program. Table 1 shows characteristics of the sample.

Measures

Parenting Stress Index

The Parenting Stress Index (PSI) (Abidin, 1995) is a 120-item instrument developed to assess the impact of the parenting role on an individual's stress level. Items are scored on a 5-point Likert scale, with a response of 5 indicating "strongly agree" and 1 meaning "strongly disagree." The PSI differentiates between stress that is child-related and stress that is parent-related (i.e., stress associated with other aspects of parent adaptation). The Child Domain subscales (Adaptability, Acceptability, Demandingness, Mood, Distractibility/Hyperactivity, and Reinforces Parent) assess the presence of child behaviors and characteristics that are stressful to parents. The Parent Domain subscales (Depression, Attachment, Restriction of Role, Sense of Competence, Social Isolation, Relationship with Spouse, and Parent Health) assess dimensions of parent stress related to personal adjustment and family functioning. A large body of data exists with respect to the PSI's reliability and validity

Table 1
Sample Characteristics

Variable	Typical (n = 23)	ASD (n = 37)
Age (at entry) Mean		
Child (Months)	24.35 (SD = 5.03)	28.35 (SD = 5.18)
Mother	32.57 (SD = 5.43)	32.46 (SD = 3.36)
Father	34.57 (SD = 5.04)	35.12 (SD = 5.41)
Child Gender (% Males)	44	78
Child Ethnicity (%)		
White	71	77
Latino	5	12
Asian/Pacific Islander	10	3
Mixed/Other	14	9
Household Status (% with 2 parents)	91	94
Highest Level of Education-Mother (%)		
High School	0	7
Some College	43	56
College	24	22
Graduate	33	14
Highest Level of Education-Father (%)		
High School	19	4
Some College	38	48
College	0	19
Graduate	43	30
Employment Outside of Home (%)		
Mothers	81	43
Fathers	100	100
Bayley (Mean)	107.41 (SD = 10.55)	57.77 (SD = 12.68)
GARS (Standard Score) (Mean)		
Communication	4.8 (SD = 4.03)	6.17 (SD = 4.18)
Social Interaction	2.67 (SD = 2.13)	6.54 (SD = 2.41)
Stereotyped Behavior	4.35 (SD = 2.82)	7.69 (SD = 2.14)

and it has been used frequently with parents of children with autism and developmental disabilities (Abidin, 1995). Reliability coefficients for the Child domain range from 0.85–0.89, for the Parent domain 0.90–0.95, and for the Total Stress score 0.92–0.95. Test-retest Spearman rank-order coefficients were 0.817 Child domain and 0.706 Parent domain indicating a significant ($p < .01$) relationship (Abidin, 1983; Hutcheson & Black, 1996; Loyd & Abidin, 1985). Consistent with previous investigations on clinically elevated stress in parents of children with disabilities, we used a cutoff of the 75th percentile to identify parents who reported significantly elevated stress (Robbins, Dunlap, & Pleinis, 1991).

Bayley Scales of Infant Development, 2nd Edition (BSID-II) (Bayley, 1993)

The Bayley Scales is a standardized test of developmental functioning. A program psychologist administered the mental scale to each child at entry and exit. The mental scale yields a normalized standard score called the Mental Development Index (MDI), evaluat-

ing a variety of abilities: sensory/perceptual acuities, discriminations, and response; acquisition of object constancy; memory, learning, and problem solving; vocalization, beginning of verbal communication; basis of abstract thinking; habituation; mental mapping; complex language; and mathematical concept formation. The assessment was standardized on a representative sample of 1,700 children in the United States. The MDI, with a mean of 100 and a standard deviation of 15, was used to determine change in child overall developmental functioning. The psychometric properties of the instrument are reportedly high for all scales. Reliability coefficients for MDI range from 0.78 to 0.93. Adequate short-term test/retest stability and interrater reliability are also reported (Bayley, 1993).

Gilliam Autism Rating Scale (GARS) (Gilliam, 1995)

The GARS is a norm-referenced assessment of severity of autistic symptoms based on a national sample of individuals with autism. Items on the GARS are based on the definitions of autism adopted by the Autism Society of America and the *Diagnostic and Statistical Manual of Mental Disorders: Fourth Edition* (DSM IV, 1994). The items are grouped into four subtests: Stereotyped Behaviors, Communication, Social Interaction, and Developmental Disturbances. The GARS has three core subtests that describe specific and measurable behaviors and an optional subtest (Developmental Disturbances) that allows parents to contribute data about their child's development. Each child's parents completed the GARS at program entry and exit. Validity and reliability of the instrument are high. Coefficients of reliability (internal consistency, test-retest, and inter-scoring) for the subtests are all in the 0.80s and 0.90s. It should be noted that no norms are currently available for children under three. The autism quotient (AQ) on the GARS was used to determine severity of autism.

Inclusion Program

The Children's Toddler School (CTS) is located in a southern California city and enrolls 12 children total per class session, 4 children with ASD and 8 typically developing children. The program houses one classroom. The ages of children in the classroom ranges from 18–36 months. There are two sessions for the children with ASD that run Monday through Friday; a morning session from 8:30–1:30 p.m. and an afternoon session from 1:00–5:00 p.m. The typically developing children are enrolled for full-day care, which includes lunch and a nap period (in which the children with autism are in another area of the building). At the minimum, there are 4 teachers in the classroom at any given time, which results in a 3:1 ratio of students to teachers. All of the teachers have obtained at least a bachelor's degree in psychology, child development or a related field. On a typical day, the children follow a structured daily schedule of free play, snack time, circle time, lunch,

nap, and free play outside. As a part of the inclusion program, speech and occupational therapists include all of the children in specialized group activities designed to promote communication and motor development. In general, the program attempts to provide a developmentally appropriate toddler curriculum to the children enrolled in the program. Additional emphasis is placed on language, social skills, and self-help skills development in order to encourage and facilitate these skills in the children with ASD as well as the typically developing toddlers. Incidental teaching techniques are used with all of the children in the classroom. Additional techniques designed specifically for use with children with ASD are also introduced for use with the children without ASD as necessary (see Stahmer & Ingersoll, 2004 or contact the first author for further information about the inclusion program). Some techniques are not specifically utilized with the typically developing toddlers (e.g., picture communication) but all of the children are exposed to the various teaching methods.

Parent participation is an integral part of the program. There is a family education component for parents of children with ASD, which consists of a weekly 2-hour home visit with one of the classroom teachers. The same teacher works with the family throughout their tenure at CTS. Parents are taught the techniques used in the classroom, and agree to provide an additional 10 hours per week of service with their children each week. Naturalistic techniques focused on increasing communication, play and interaction are emphasized because they are most effective for parent training (Schreibman & Koegel, 1996). In addition, the teacher assists parents with developing goals for the child and teaches the parents positive behavioral support strategies. Community goals may be addressed as well. A resource center is available at the school to provide additional information to parents about ASD as well as about community programs. The home teacher or psychologist accompanies the parent to transition and Individual Education Program (IEP) meetings to facilitate a smooth transition to the school district at age 3. Home visits are not provided for parents of typically developing children. All parents are invited to observe the program through a one-way mirror as often as they like. The teachers, psychologist, speech therapist and occupational therapist are available to meet with any interested parents on a weekly basis.

Procedure and Data Analysis

After expressing interest in the program, all children were screened for enrollment which included completion of the Bayley Scales of Infant Development, 2nd Ed (BSID-II). Once enrolled, parents were asked to complete a battery of assessments including the Parenting Stress Index (PSI) and the Gilliam Autism Rating Scale (GARS). They were asked to participate in the

research project and signed an informed consent form soon after enrollment. Parents were provided the PSI and GARS in paper and pencil format which they completed at home and returned the completed forms the following day. Families were not required to participate in the research project in order to be enrolled in the school. One family declined participation during the operation of the program. The same battery of assessments, including the PSI and the GARS, was completed again approximately one month prior to the child exiting the program (in order to ensure that all paperwork and reports were available upon transition to new programs). The average time between completion of the pre and post measures for children with ASD was 8.0 months (Range: 2–18; SD = 5.5) and 11.04 (Range: 3–20; SD = 5.5) for typically developing children (TDC).

Analyses of co-variance (ANCOVA) were used to examine stress levels after participation in the CTS program for mothers and fathers by groups (ASD and TDC). The pretest scores were entered into the analyses as covariates. Mothers and fathers stress was analyzed independently. Including them in the same analyses violates the independence assumption because both parents are reporting on stress about the same child and could result in small standard errors and a potential increase in Type 1 error. Independent samples t-test were utilized to compare the mean stress levels reported by the two groups of mothers and fathers. A Bonferonni correction was used to correct for the number of statistical tests. Paired samples t-tests were employed to examine changes in stress from pre to post participation in the CTS within groups. Lastly, a regression analysis was used to determine if certain child characteristics (cognitive functioning and symptoms of autism) predicted stress levels in mothers and fathers of children with autism.

Results

Overall Parental Stress by Groups

Analyses of co-variance (ANCOVA) were conducted to examine the influence of participation in the toddler school inclusion program on post assessment by groups (ASD and TDC). The pre-test score was entered into the calculations as a covariate. The ANCOVA test revealed a significant overall effect, $F(2, 57) = 52.154$, $p < .001$, partial $\eta^2 = 0.647$ for mothers on the child domain score and on the parent domain score, $F(2, 57) = 33.902$, $p < .001$, partial $\eta^2 = 0.543$. The omnibus test for fathers was also significant for the child domain score, $F(2, 40) = 14.526$, $p < .001$, partial $\eta^2 = 0.421$ and for the parent domain score, $F(2, 40) = 18.730$, $p < .001$, partial $\eta^2 = 0.484$.

Mothers' Stress

Independent samples t-tests were used to compare the mean levels of child domain and parent domain stress in mothers by the two groups (ASD and TDC).

As shown in Figure 1, mothers of children with ASD report significantly higher levels of stress in the child domain than parents of typically developing children at entry ($t = 6.030$; $p < .001$) and exit ($t = 5.036$; $p < .001$). The effect sizes for the Child Domain for mothers were very large at both time points (Entry = 1.57; Exit = 1.34). It is important to note that 59% of mothers of children with ASD reported significantly elevated levels of child domain stress (>75) at entry compared to 17 % of mothers of typically developing children. At program exit, 46% of mothers of children with ASD reported significantly elevated levels of child domain stress compared to 13% of mothers of typically developing children.

Also, mothers of children with ASD report significantly higher levels of stress in the parent domain ($t = 2.970$; $p < .05$) at entry and exit ($t = 2.616$; $p < .05$) than mothers of typically developing children. After controlling for the number of t-tests, the effect for mothers at program exit does not remain statistically significant ($p = .011$) according to the adjusted Bonferonni p value of .01. However, effect sizes were large at both time points (Entry = 0.81; Exit = 0.71). Additionally, 24% of mothers of children with ASD reported significantly elevated levels of parent domain stress at the beginning of their child’s entry into the program compared to 9% of mothers of typically developing toddlers. At program exit, 24% of mothers of children with ASD reported significantly elevated levels of stress compared to 8.7% of mothers of typically developing children.

Fathers’ Stress

Likewise, fathers of children with ASD reported significantly higher levels of child domain stress than fathers of typically developing children at entry ($t = 3.521$; $p < .05$) and exit ($t = 2.547$; $p < .05$). After controlling for

the number of t-tests, the effect for fathers at program exit does not remain statistically significant ($p = .015$) according to the adjusted Bonferonni p value of .01. However, the effect sizes for the Child Domain for fathers were large at both time points (Entry = 1.26; Exit = 0.82). It is important to note that 35% of fathers of children with ASD reported significantly elevated levels of child domain stress (>75) at entry compared to 13% of fathers of typically developing children. As program exit, 46% of fathers of children with ASD reported significantly elevated levels of child domain stress compared to 25% of fathers of typically developing children.

Fathers of children with ASD showed significantly higher parent domain stress than fathers of typically developing children at entry ($t = 2.077$; $p < .05$), but not at exit ($t = 1.243$; $p > .05$). The effect for fathers at entry was no longer significant ($p = .044$) after controlling for the number of tests according to the adjusted Bonferonni p value of .01. Although not statistically significant, the effect size for fathers at entry was large (0.77) and moderate at exit (0.44). Additionally, 15% of fathers of children with ASD reported significantly elevated levels of parent domain stress at the beginning of their child’s entry into the program compared to 0% of fathers of typically developing toddlers. At program exit, 18% of fathers of children with ASD reported significantly elevated levels of parent domain stress compared to 0% of fathers of typically developing children (Figure 2).

Changes in Parental Stress Levels

Paired sample t-tests were used to compare the levels of parental stress before and after their children participated in the toddler school inclusion program (see Table 2). No significant changes in parental stress were

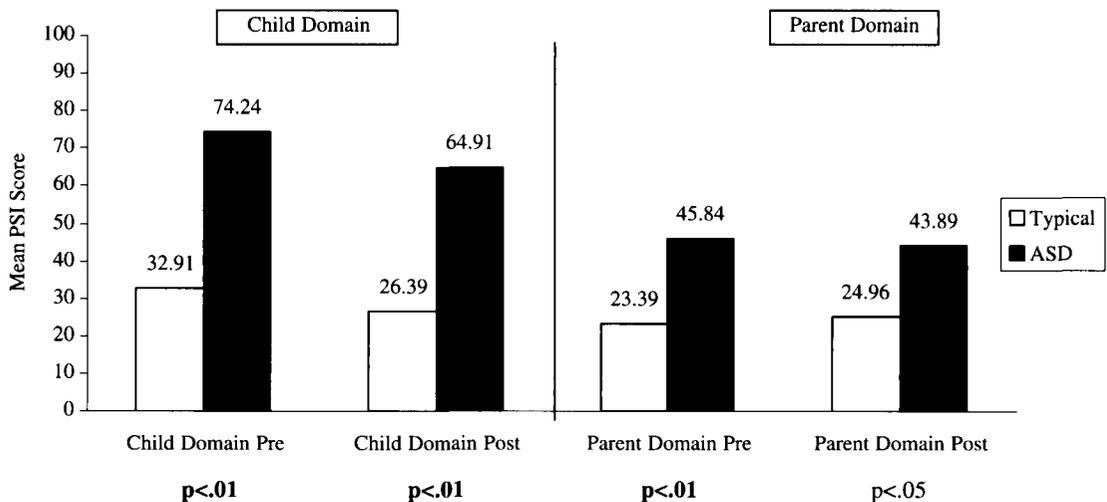


Figure 1. Comparison of mean PSI score for mothers.

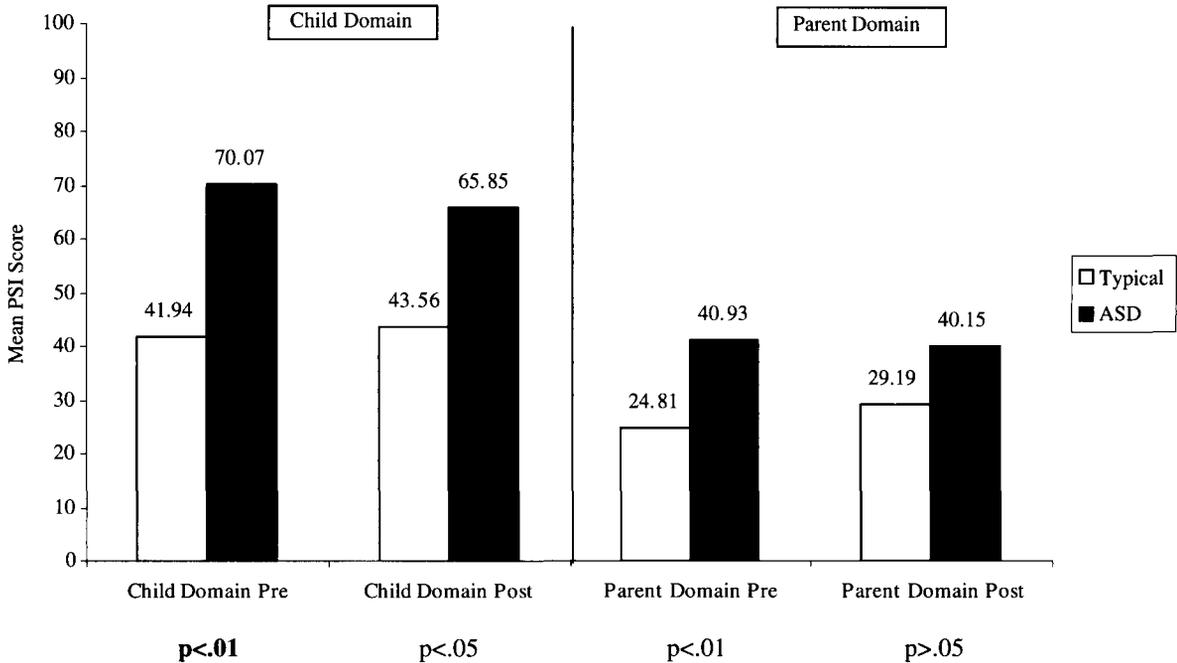


Figure 2. Comparison of mean PSI scores for fathers.

seen for parents in any group with the exception of child domain stress in mothers of children with ASD ($t = 2.557$; $p < .05$). The effect size was moderate for mothers of toddlers with ASD (0.42) and for mothers of typically developing toddlers (0.33) in the child domain. Mothers of children with ASD reported significant decreases in overall child-related stress following their children’s participation in the toddler school program.

Predictors of Parental Stress

Given previous research, we hypothesized that child characteristics would significantly predict parental stress levels for parents of children with autism. The results of the regression analyses revealed that child cognitive functioning and symptoms of autism significantly predicted scores on Child Domain stress at entry for mothers ($F(4, 28) = 5.867$ $p < .01$) accounting for 41% of the variance in maternal child-related stress (See Table 3). However, only the Social Interaction score was

a significant independent predictor of maternal stress. These child characteristics did not significantly predict Parent Domain stress for mothers or fathers, or Child Domain stress for fathers.

Discussion

Summary of Findings

Similar to previous studies, mothers and fathers of toddlers with ASD report significantly higher stress than parents of typically developing toddlers. Specifically, they report significantly higher child *and* parent-related stress. Further, they are more likely to experience *elevated* levels of stress (i.e., 59% of mothers of children with ASD report elevated child-related stress at program entry). This is consistent with other studies indicating that approximately 2/3 of mothers of young children with autism experience clinically significant levels of child-related stress (Tomanik et al., 2004).

Table 2
Changes within Groups of Mean Stress Levels

Domain	Typical			ASD		
	Pre	Post	t	Pre	Post	t
Child Domain						
Mothers	32.91	26.39	1.586	74.24	64.91	2.557*
Fathers	41.94	43.56	0.478	70.07	65.85	0.754
Parent Domain						
Mothers	23.39	24.96	0.373	45.84	43.89	0.602
Fathers	24.81	29.19	1.480	40.93	40.15	0.161

*P < .05

Table 3
Predictors of Parenting Stress (Child Domain)
for Mothers at Entry

Model	Beta	F	r ²
CD = Bayley + GARS	.069		
GARS - Comm	.092		
GARS - Social Interaction	.541**		
GARS - Stereotyped Bx	.309		
		5.867**	0.410

**P < .01

Associations of Inclusion Program and Stress Levels

This study extends the research by further understanding the relationships between childcare interventions and parent stress for very young children with disabilities. Additionally, it looks at changes in both mothers and fathers of children with and without disabilities. The only significant changes in stress from assessment at program entry to exit were seen in mothers of children with ASD. They showed significant reductions in *child-related* stress only. Participation in the childcare program was not associated with changes in parent-related stress for mothers. Also, there were no significant reductions in either domain for fathers. However, reduction of stress in mothers may also affect fathers' functioning. Gray (2003) interviewed fathers of children with autism and they reported that the biggest impact on their lives came from the indirect impact of their wives' stress, rather than the impact of the disability itself.

It is also important to note that there were no significant increases in stress for any group of parents. This is important because some may ask whether placing a typically developing child in a class with a child with a disability might be stressful for parents. This study found that that is not the case.

These results are consistent with previous research in which mothers of children with autism report higher levels of depression compared to mothers of children without autism (Olsson & Hwang, 2001). Since almost a quarter of the mothers of children with ASD report significantly elevated Parent Domain stress and there is no decrease of this type of stress at program exit, there is a strong need for further research and clinical assessment of Parent Domain stress for parents with children with developmental disabilities. These high and stable levels of parental stress which are not directly related to their child's abilities and behaviors but rather stress that results from indirect influences of having a child with ASD (e.g., increased marital issues, feelings of despair or depression, isolation) are in need of interventions. This suggests a potential need for further intervention development that is designed to support the parent and that include "parent-directed" services such as individual counseling for the parents. Clinically

elevated parent-related stress has been associated with poorer child outcomes in intervention programs, especially those that have a heavy parent education component (Robbins, Dunlap, & Pleinis, 1991). Implications for the subgroup of parents of children with ASD who report elevated stress are discussed below.

Child Social Interaction Skills and Maternal Child-related Stress

Social interaction skills significantly predicted maternal child-related stress in mothers of children with ASD independently. These results are not surprising as social deficits are some of the most difficult to ameliorate in children with ASD and are considered a hallmark feature of the disorder. However, many early intervention programs begin their teaching with pre-academic and language skills and not social skills. This finding highlights the importance of a focus on social deficits in this population, in order to increase child functioning and family functioning. At this point it is not known which specific aspects of social interaction deficits affect parental stress levels, more research is needed in this area. It is important to note that none of the child characteristics significantly predicted Parent Domain stress in mothers or fathers' stress (child domain or parent domain).

Study Limitations

There are a number of limitations to this study. First, since we did not have a control group of children with ASD who were enrolled in a self-contained setting or in-home early intervention program (as opposed to an inclusion setting), we cannot conclude that the reductions in stress seen in mothers of children with autism were due to the inclusion nature of the program, or merely comprehensive early intervention in itself. Further, we did not control for the length of time that the children were enrolled in the toddler school when measuring changes in parental stress. There was a slightly longer interval between entry and exit administrations of the PSI for the two groups of parents with the typical children spending on average an additional three months in the program. It is unclear how this additional time may contribute to the results. However, the samples of children were matched on age, socio-economics, race/ethnicity and family constellation controlling for many extraneous variables. Last, mothers appeared to be the primary caregiver most often in both groups of children, however information on the specific amount of time mothers and fathers spent providing direct care to the children was not available. Thus, it is unknown how stress may be related to the differing responsibility of child rearing for each parent.

Implications: From Stress to Adaptation

Since parental stress levels have been documented as an important variable in intervention effectiveness, it is important that parent stress levels be evaluated as

part of a screening and assessment protocol for interventions for children with ASD (Lessenberry & Remfeldt, 2004). There are a number of instruments, including the PSI that may be useful to practitioners. Lessenberry & Rehfeldt, 2004 for a description. Using standardized measures of stress will assist providers in determining the *types* of stress that families experience, and deliver family-centered interventions accordingly.

In order to reduce stress and increase family adaptation to raising a young child with ASD, a number of family support options may be useful for families (Hastings & Beck, 2004), especially families of young children who have recently received a diagnosis. For example, supporting parents through parent-to-parent programs may be useful in providing parents with additional sources of support from other parents of children with disabilities. In these programs, parents of children with disabilities who are trained in providing support to other parents are matched with parents who are in need of support services (both information and emotional support) (Santelli, Ginsberg, Sullivan, & Niederhauser, 2002). These programs have a number of positive impacts on families including improvements in parents' perceptions in their abilities to cope, get their needs met and solve problems related to their child's disability (Santelli et al., 2003; Singer et al., 1999). Likewise, interventions such as respite care have been shown to significantly reduce maternal stress for many parents of children with developmental disabilities (Chan & Sigafos, 2001; Rimmerman, 1989).

There has been increased attention to improving parents' coping skills and stress management as a method to reduce the impact of stress on the family system and increase family adaptation. This may be especially important for parents who report elevated levels of *parent-related stress*. Bitsika and Sharpley (1999, 2000) report that parents found that groups focusing on specific behavioral stress management skills (progressive muscle relaxation, guided imagery) and biofeedback were more useful than groups that primarily emphasized support. Further, Hawkins and Singer (1989) found that teaching parents specific stress management procedures enhanced parent ability to cope with parenting stress. Nixon and Singer (1993) evaluated the impact of a group intervention aimed to teach behavioral and cognitive techniques to help reduce parental stress. Participation in the groups was associated with significant reductions in guilt, negative automatic thoughts, internal negative attributions and depression.

Very few studies have systematically examined stress in fathers or the impact of intervention on father functioning. These current data support past research indicating that mothers of children with ASD report higher levels of stress than their husbands (Moes et al., 1992). However, in the current study child participation did not impact fathers' reported stress. We hypothesize that this may be related to the less significant

role that fathers may play in their children's education (e.g., Bristol, Gallagher, & Schopler, 1988; Haldadian & Merbler, 1995). This is an important area for future research. Specifically, more research is needed to develop effective methods to involve fathers more fully in education and intervention and target stress specific to the father's role.

Conclusion

The results of this study are consistent with previous research indicating that parents of children with ASD experience higher levels of stress than parents of typically developing children. It extends the previous research by assessing stress in parents of toddlers enrolled in an inclusive toddler school program. Mothers' of children with ASD child-related stress reduced after program participation suggesting that having their child involved in the program may be positive for their well-being. However, these positive stress reductions were not found for fathers of children with ASD. There were also no improvements for either mothers or fathers on parent-related stress. These results indicate that more attention is needed to assessing stress levels in both parents and there needs to be an increased emphasis in early education programs to address parent-related stress through specific parent-directed types of services in addition to the child-focused childcare programs.

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